

JOSEPH W. TRINGE

Lawrence Livermore National Laboratory
P.O. Box 808, L-282
Livermore, CA 94551-9900
tringe2@llnl.gov, 925-422-7725

2111 Londonderry Ct
Walnut Creek, CA 94596
925-457-5925
jtringe@stanfordalumni.org

SUMMARY

- Technical leader experienced in the successful development and characterization of devices and materials with novel electrical, optical, molecular transport properties; also experienced in development of advanced methods for understanding energetic materials safety
- Guided multi-disciplinary technical teams in the Departments of Energy and Defense to execute complex experimental and modeling efforts which resulted in advanced functional prototypes; developed effective collaborations with industrial and university partners
- Created proposals funded for multiple years by Departments of Energy and Defense and the University of California
- Experienced with microfabrication processes for electronic and optical devices as well as numerous materials characterization methods, including scanning probe microscopy, transmission electron microscopy, scanning electron microscopy, and flash x-ray radiography
- Author of 35 peer-reviewed publications and five U.S. patents

EDUCATION

Ph.D., Materials Science and Engineering Stanford University (2000)
Thesis: Electrical and Structural Properties of Polycrystalline Silicon
M.S., Materials Science and Engineering Stanford University (1997)
A.B., Physics (*magna cum laude*) Harvard University (1994)

PROFESSIONAL EXPERIENCE

- Lawrence Livermore National Laboratory
Staff Scientist, Physical and Life Sciences Directorate (2003-present)
- Office of the Under Secretary of Defense (AT& L) (USAF Reserve)
Chief, Technology Transition, Joint Reserve Detachment (2013-present)
- U.S. Air Force Office of Scientific Research (USAF Reserve)
Technical Advisor, International Office (2012-2013)
Program Manager (2007-2012)
- U. S. Air Force Research Laboratory
Lead, Electronics Foundations Program, Space Vehicles Directorate (2001-2003)

PUBLICATIONS (35 total)

J. W. Tringe, N. Ileri, H. Levie, P. Stroeve, V. Ustach, R. Faller and P. Renaud, “Molecular Dynamics and Monte Carlo simulations resolve apparent diffusion rate differences for proteins confined in nanochannels,” *Chemical Physics*, vol. 457, 19-27, August 2015.

T. Willey, L. Lauderbach, F. Gagliardi, T. van Buuren, E. Glascoe, **J. W. Tringe**, J. Lee, H. K. Springer, J. Ilavsky, “Mesoscale evolution of voids and microstructural changes in HMX-based explosives during heating through the beta-delta phase transition,” *Journal of Applied Physics*, vol. 118, August 2015.

S. Van Norman, **J. W. Tringe**, J. Sain, J. Falconer and A. Weimer, "Using atomic layer deposited tungsten to increase thermal conductivity of a packed bed," Applied Physics Letters, vol. 106, 153102, April 2015.

M. Rahman, E. Yu, E. Forman, C. Roberson-Mailloux, J. Tung, **J. W. Tringe**, and P. Stroeve, "Modified release from lipid bilayer coated mesoporous silica nanoparticles using PEO-PPO-PEO triblock copolymers," Colloids and Surfaces B-Biointerfaces, vol. 122, 818-822, October 2014.

J. W. Tringe, E. A. Glascoe, M. A. McClelland, D. Greenwood, R. D. Chambers, H. K. Springer, and H. W. Levie, "Pre-ignition confinement and deflagration violence in LX-10 and PBX 9501", Journal of Applied Physics vol. 116, 054903, August 2014.

J. W. Tringe, R. J. Kane, K. S. Vandersall, M. C. Converse, F. Garcia and C. M. Tarver, "Microwave interferometry for understanding deflagration-to-detonation and shock-to-detonation transitions in porous explosives," Proceedings of the Fifteenth International Detonation Symposium, 284, San Francisco, California, July 2014.

J. W. Tringe, S. E. Létant, Tringe, L. C. Dugan, H. W. Levie, A. L. Kuhl, G. A. Murphy, S. W. Alves, K. S. Vandersall and M. L. Pantoya, "Comparison of *Bacillus atrophaeus* spore viability following exposure to detonation of C4 and to deflagration of halogen-containing thermites," Journal of Applied Physics, vol. 14 (23), 234903, December 2013.

N. Ileri, R. Faller, A. Palazoglu, S. E. Létant, **J. W. Tringe**, P. Stroeve, "Molecular transport of proteins through nanoporous membranes fabricated by interferometric lithography," Physical Chemistry Chemical Physics, vol. 15, no. 3, 965-971, January 2013.

J. W. Tringe, H. W. Levie, S. K. McCall, N.E. Teslich, M. A. Wall, C. A. Orme, M. J. Matthews, "Enhanced scattering and nonlinear conductivity in Ag-doped hollow ZnO microspheres," Applied Physics A-Materials Science & Processing, vol. 109, no. 1, 15-23, October 2012. (invited paper)

E. A. Glascoe, H. K. Springer, **J. W. Tringe** and J. L. Maienschein, "A comparison of deflagration rates at elevated pressures and temperatures with thermal explosion results," Proceedings of the 2011 American Physical Society Shock Compression of Condensed Matter Conference, AIP Conference Proceedings, vol. 1426, 2012.

W. M. Howard, A. L. Kuhl, **J. W. Tringe**, "Simulation of the reflected blast wave from a C-4 charge," Proceedings of the 2011 American Physical Society Shock Compression of Condensed Matter Conference, AIP Conference Proceedings, vol. 1426, 2012.

J. D. Molitoris, J. D. Batteux, R. G. Garza, **J. W. Tringe**, P. C. Souers, and J. W. Forbes, "Mix and instability growth from oblique shock," Proceedings of the 2011 American Physical Society Shock Compression of Condensed Matter Conference, AIP Conference Proceedings, vol. 1426, 2012.

N. Ileri, P. Stroeve, A. Palazoglu, R. Faller, S. H. Zaidi, H. T. Nguyen, J. A. Britten, S. E. Létant, and **J. W. Tringe**, "Fabrication of functional silicon-based nanoporous membranes," Journal of Micro-Nanolithography MEMS and MOEMS, vol. 11, no. 1, Art. No. 013012, 22 March 2012.

- N. Ileri, S. E. Létant, A. Palazoglu, P. Stroeve, **J. W. Tringe**, and R. Faller, “Mesoscale simulations of biomolecular transport through nanofilters with tapered and cylindrical geometries,” *Physical Chemistry Chemical Physics*, vol. 14, no. 43, 15066-15077, 2012.
- J. W. Tringe**, H. W. Levie, B. S. El-Dasher, R. Swift and M. A. Wall, “*In situ* observation of the formation of hollow zinc oxide shells,” *Applied Physics Letters*, vol. 98, no. 24, Art. No. 241907, June 2011.
- W. Sun, J. A. Romagnoli, **J. W. Tringe**, S. E. Létant, P. Stroeve, and A. Palazoglu, “Line edge detection and characterization in SEM images by wavelets,” *IEEE Transactions on Semiconductor Manufacturing* 22, 180-187, 2009.
- J. W. Tringe**, J. D. Molitoris, L. Smilowitz, J. R. Kercher, H. K. Springer, B. F. Henson, E. A. Glascoe, D. W. Greenwood, R. G. Garza, B. M. Wong, J. D. Batteux and J. L. Maienschein, “Time-sequenced x-ray observation of a thermal explosion,” *Proceedings of the 2009 American Physical Society Shock Compression of Condensed Matter Conference*, AIP Conference Proceedings, vol. 1195, 424-427, 2009.
- J. W. Tringe**, G. Vanamu and S. H. Zaidi, “Templated control of Au nanospheres in silica nanowires,” *Journal of Applied Physics*, vol. 104, no. 9, Art. No. 094317, November 2008.
- R. Prinja, J. Anderson, R. Manginell, **J. W. Tringe**, K. Sopian, N. Amin, and S. H. Zaidi, “Absorption enhancement in thin-film silicon solar cells in SOI configuration using physical and geometrical optics,” *Proceedings of the 33rd IEEE Photovoltaic Specialists Conference*, 876-879, 2008.
- J. W. Tringe**, A. M. Conway, T. E. Felter, et al., “Radiation effects on InGaN quantum wells and GaN simultaneously probed by ion-beam induced luminescence,” *IEEE Transactions on Nuclear Science*, vol. 55, no. 6, 3633-3637, 2008.
- J. W. Tringe**, G. T. E. Felter, C. E. Talley, et al., “Radiation damage mechanisms for luminescence in Eu-doped GaN,” *Journal of Applied Physics*, vol. 101, no. 5, Art. No. 054902, March 2007.
- J. W. Tringe**, J. D. Molitoris, R. G. Garza, H. G. Andreski, J. D. Batteux, L. M. Lauderbach, E. R. Vincent, and B. M. Wong, “Detailed comparison of blast effects in air and vacuum,” *Proceedings of the 2007 American Physical Society Shock Compression of Condensed Matter Conference*, AIP Conference Proceedings, vol. 955, 1305-1308, 2007.
- J. W. Tringe**, D. S. Clague, J. V. Candy, A. K. Sinensky, C. L. Lee, R. E. Rudd, A. K. Burnham “Model-based processing of deflection by cantilever-based sensor arrays,” *IEEE Journal of Microelectromechanical Systems*, 15 (5): 1379-1391, October 2006.
- B. S. El-Dasher, J. J. Gray, **J. W. Tringe**, J. Biener, A. V. Hamza, C. Wild, E. Woerner, P. Koidl, “Crystallographic anisotropy of wear on a polycrystalline diamond surface,” *Applied Physics Letters*, Art. No. 241915, Jun 12, 2006.
- J. Biener, P. B. Mirkarimi, **J. W. Tringe**, S. L. Baker, Y. Wang, S. O. Kucheyev, N. E. Teslich, K. J. J. Wu, A. V. Hamza, C. Wild, E. Woerner, P. Koidl, K. Bruehne, H. J. Fecht, “Diamond ablators for inertial confinement fusion,” *Fusion Science and Technology*, 49 (4): 737-742, May 2006.

S. O. Kucheyev, J. Biener, **J. W. Tringe**, Y.-M. Wang, P. B. Mirkarimi, T. van Buuren, S. L. Baker, A. V. Hamza, K. Bruhne, H. J. Fecht, "Ultrathick, low-stress nanostructured diamond films, Applied Physics Letters, 86 (22): Art. No. 221914 May 30 2005.

J. W. Tringe, J. S. Solomon, R. A. B. Devine, "Temperature-dependent current transport in low-k dielectrics," Journal of the Electrochemical Society 151 (5): F128-F131, 2004.

J. W. Tringe, T. A. Uhlman, A. C. Oliver, and J. E. Houston, "A single-asperity study of Au/Au electrical contacts," Journal of Applied Physics, vol. 93, no. 8, 15 April 2003.

R. A. B. Devine, D. Ball, J. D. Rowe, and **J. W. Tringe**, "Irradiation and humidity effects on the leakage current in $\text{SiO}_x(\text{CH}_3)_y$ -based intermetal dielectric films," Journal of the Electrochemical Society, 150 (8) F151-F155, August 2003.

R. A. B. Devine, **J. W. Tringe**, and J. R. Chavez, "Radiation-induced charge trapping and rebound in low-k silsesquioxane-based intermetal dielectric films," IEEE Transactions on Nuclear Science, vol. 49, no. 6, December 2002.

J. W. Tringe, J. Nocerino, R. Tallon, W. Kemp, W. Shafarman, and D. Marvin, "Ionizing radiation effects in copper indium diselenide thin-film solar cells," Journal of Applied Physics, vol. 91, no. 1, 1 January 2002.

J. W. Tringe and J. D. Plummer, "Electrical and structural properties of polycrystalline silicon," Journal of Applied Physics, vol. 87, no. 11, 1 June 2000.

J. W. Tringe, M. D. Deal, and J. D. Plummer, "Transparent probe test structure for electrical and physical characterization of defects in thin films," Journal of the Electrochemical Society, vol. 147, no. 12, December 2000.

J. W. Tringe, M. D. Deal, and J. D. Plummer, "A diffraction-based transmission electron microscope technique for measuring average grain size," Electrochemical and Solid-State Letters, vol. 3, no. 11, November 2000.

J. W. Tringe, M. D. Deal, and J. D. Plummer, "Hydrogen passivation in polycrystalline silicon resistors," Electrochemical and Solid-State Letters, vol. 3, no. 11, November 2000.

Book chapter

J. C. Lyke, W. G. Wilson, and **J. W. Tringe**, "Aerospace Applications of Microelectromechanical Systems," in *MEMS Packaging*, edited by Tai-Ran Hsu, 2004 (Institution for Electrical Engineers)

PATENTS

C. Stevens and **J. W. Tringe**, "Room-temperature quantum noise limited spectrometry and methods of the same" US Patent 8901495, December 2, 2014.

J. W. Tringe, R. L. Balhorn S. Zaidi, "Method of fabricating a scalable nanoporous membrane filter, US Patent Number 8,512,588, August 20, 2013.

S. H. Zaidi, **J. W. Tringe**, G. Vanamu R. Prinja, "Metallic nanospheres embedded in nanowires initiated on nanostructures and methods for synthesis thereof," US Patent Number 8,093,474, January 10, 2012.

J. W. Tringe, A. E. Gash and T. W. Barbee, "Electrical initiation of an energetic nanolaminate film," US Patent 7,687,746, March 10, 2010.

J. W. Tringe, "A method for creating a reconfigurable nanometer-scale electronic network," US Patent Number 6,812,117, November 2, 2004.

AWARDS AND HONORS

IMA Officer of the Year, U. S. Air Force Office of Scientific Research (2010)
Technical Management Award, U. S. Air Force Materiel Command (2002)

One award of this type presented each year in the 88,000-person Materiel Command
National Academy of Engineering: 2003 Symposium on Frontiers of Engineering

One of 100 'outstanding leaders' competitively selected to participate
U. S. Air Force IDEA Award (2001, 2005)
U. S. Air Force Research Laboratory Scientific/Technical Achievement Team Award (2000)
Stanford University Graduate Fellowship (1994-95)
Dr. Theodore von Karman Graduate Fellowship (1994-95)
Distinguished Graduate of Air Force R.O.T.C. Detachment 365 (1994)
Rowland Fund Grant for research at Harvard University (1993)
Harvard College Scholarship (1992, 1993, 1994)
Harvard College Detur Prize (1991)
Four-year U. S. Air Force Reserve Officer Training Corps Scholarship (1990)
National Merit Scholarship (1990)